

*AS*

14. The method of claim 6, wherein the high purity silicon carbide coating contains less than about 200 parts per billion of impurities.

### Remarks

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding office action is respectfully requested.

Claims 6-11 remain in this application. Claims 1-5 have previously been withdrawn from consideration.

#### **1. Restriction Requirement**

The Examiner issued a Restriction Requirement identifying the following groups of claims as being drawn to potentially distinct inventions:

Group I. Claims 1 -5, drawn to a furnace.

Group II. Claims 6 -11, drawn to a method of making a fiber.

The Examiner asserted that these inventions may be regarded as independent and distinct from one another because they do not relate to a single general inventive concept and lack the same or corresponding special technical features.

In a telephone conference with the undersigned attorney/agent of record dated July 31, 2001, a provisional election to Group II, claims 6-11 was made, with traverse. Applicants hereby confirm that provisional election of Group II upon which claims 6-11 read, however, make the election without traverse.

#### **2. § 102 Rejections**

The Examiner has rejected claim 6 under 35 U.S.C. § 102(b) as being anticipated by EP 464 613(the Ohga patent).

The Examiner asserts that Ohga clearly discloses the invention (see Figure 1 and page 6, 1<sup>st</sup> col., lines 48-51).

Applicants amend claim 6 to include the *limitations of claim 9* and the further limitation that the muffle tube includes *at least two generally tubular sections*. The Ohga patent does not teach or suggest a high purity (less than 900 parts per million of impurities in the SiC coating) and where the muffle includes at least two generally tubular sections. For these reasons, the 35 U.S.C. § 102 rejection of claim 6 should be withdrawn.

### 3. § 103 Rejections

The Examiner has rejected claims 9-11 under 35 U.S.C. § 103 as being unpatentable for obviousness over EP 464 613 (the Ohga patent).

The Examiner asserts that it would have been obvious to use silicon carbide that is as pure as technologically possible as it is well known that impurities in anything are not generally desirable.

Inventors herein have discovered that high purity SiC coatings are desired for long life of the muffle and that multiple muffle sections are desired to obtain the appropriate quality and quantity of coating on the inner surface of the muffle. The cited references do not teach or suggest providing a muffle including low impurities and multiple sections, which are both desirable to achieve long service life of the muffle tube. Therefore, as amended, claim 6 is non-obvious in light of the reference of record and the § 103 rejection thereof should be withdrawn. Claim 9 has been canceled without prejudice or disclaimer.

As to claims 10-11, Examiner states it would have been obvious to have a low of loss as possible because a high loss means losing signal integrity.

It is believed that Examiner has misunderstood the scope of claims 10-11. The claims refer to point defect product losses, i.e., fiber that is of unacceptable quality due to point defects that cause attenuation in drawn sections of fiber. Claims 10-11 relate to point defects losses being less than 4% and 1%, respectively. Claims 10-11 are allowable for at least the reasons indicated for claim 6. However, it should be recognized that the purity and use of multiple coated segments in the muffle achieve these low product losses. In addition, to correct a clerical error, the dependency of claim 11 is corrected to depend from claim 6 instead of claim 1.

The Examiner has rejected claims 7-8 under 35 U.S.C. § 103 as being unpatentable for obviousness over EP 464 613 (the Ohga patent) as applied to claim 6 above and further in view of US Patent No. 3,925,577 (the Fatzer patent).

The Examiner asserts that Fatzer discloses that coating carbon bodies usually has poor adherence. Fatzer further discloses a method of coating with SiC with good adherence. It would have been obvious to use the Fatzer method of creating the Ohga coated muffle – for the improved coating characteristics the Fatzer method has. Further, the Fatzer patent requires the heating of the furnace to temperatures within the claimed range. Thus the limitations of claims 7-8 are met during the claimed “providing” step. It is noted that the

claim does not require that all of the furnace be heated to 1900C or that the temperature be maintained during the entire process.

Claims 7-8 are allowable for at least the reasons given with respect to claim 6.

New claims 12-14 are allowable because the cited references do not teach or suggest providing SiC layer thicknesses on the inside surface of the muffle of greater than 2 mils; more preferably 5-8 microns nor impurities less than 200 parts per billion in the SiC coating.

The cited prior art references (Blankenship, Paek, Lysson and Saito) are no more relevant to the claimed invention than are the references relied upon by Examiner.

#### **4. Drawings and Specification**

Applicants have amended the drawings to include reference numeral 28 (the muffle) in the drawing Fig. 1. This numeral 28 was inadvertently omitted. In addition, the muffle is shown marked-in-red including three axial sections as described on page 6, lines 26-29. In addition, the specification has been amended (see page 6 paras. 2 and 3) to correct the numeral "26" to read "28" in three places as shown below.

#### **5. Conclusion**

In view of the above, Applicants submit that the pending claims are in condition for allowance, and such allowance is earnestly solicited.

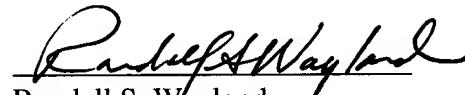
Applicants believe that a two month extension of time is necessary to make this Response timely. Should Applicants be in error, Applicants respectfully request that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Response timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Randall S. Wayland at (607) 974-0463.

Respectfully submitted,

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Date: 12/31/01



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Randall S. Wayland

### Changes Made to the Specification and Claims

#### In the Specification

Please amend the second full paragraph of page 6 as follows:

Housing 12, which is water cooled, may be fabricated of stainless steel or the like. Preferably, housing 12 axially runs the full length of the muffle [26] 28 to fully enclose the muffle. An inert gas such as argon is flowed into the housing 12 to prevent oxidation of the outer surface of the muffle [26] 28.

Please amend the third full paragraph of page 6 as follows:

A waveguide fiber preform 32 (shown in phantom) is axially inserted into muffle [26] 28 until a first end 34 thereof is positioned at the "hot zone" located within the induction coil 30. After hot zone has reached a temperature sufficient to draw fiber from the preform, which is preferably above 1900°C, an optical fiber 36 is drawn from the end portion 34 of the

preform 32. In an important aspect of the invention, the inner surface of the muffle 28 adjacent the preform 32 has a coating of high purity silicon carbide thereon to prevent deterioration of the graphite muffle. The graphite muffle 28 preferably comprises at least two and, more preferably, three axial segments because it is difficult to coat sections of the muffle longer than about 40 inches.

### In the Claims

(Amended) 6. A method for producing a waveguide fiber in a draw furnace including a graphite, generally tubular muffle having an inner surface comprising the steps of:

providing a high purity silicon carbide coating on the inner surface of the graphite muffle wherein the high purity silicon carbide coating contains less than about 900 parts per billion of impurities and the muffle comprises at least two generally tubular sections;

disposing waveguide fiber preform in the muffle;

heating the furnace to a temperature sufficient to draw fiber from the preform; and

drawing fiber from the preform.

9. Canceled

(Amended) 11. The method of claim [1] 6, wherein the waveguide fiber drawn from the furnace has a point defect loss less than about 1%.

12. The method of claim 6, wherein the high purity silicon carbide coating has a layer thickness of at least two mils.

13. The method of claim 12, wherein the high purity silicon carbide coating has a layer thickness of between about 5 and 8 microns.

14. The method of claim 6, wherein the high purity silicon carbide coating contains less than about 200 parts per billion of impurities.